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From-HENKEL CORPORATION - PATENT DEPT,

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DATE: October 16, 2003

TO:
Name: Commissioner for Patents

From:
Name: Daniel S. Ortiz

Location: Washington, DCLocation: Gulph Mills, PAFax No.: 703-872-9311Fax No.: 610-278-6548

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Docket No. H 1215PCT/US

SN: 08/702,625

Art Unit: 1711

Confirmation No. 6917

Enclosure:

1. Amendment after Final Rejection

PATENT
Docket No. H 1215 PCT/US
Response under 37 CFR 1.116
Expedited Procedure
Examining Group 1711

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re: Application of
Kluth et al.

Confirmation No. 6917

Serial No. 08/702,625

Examiner: John M. Cooney

Filed: 08/25/1996

Art Unit: 1711

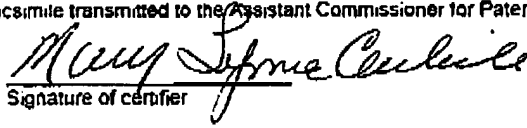
Title: FOAM PLASTIC FROM DISPOSABLE PRESSURIZED
CONTAINERS

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AMENDMENT AFTER FINAL REJECTION

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Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

In Response to the Official Action of August 11, 2003, Applicants respectfully request that the rejection be reconsidered in light of the following discussion

As presently claimed, Applicants invention is a system for the production of a plastic foam. The system comprises a disposable pressurized container containing a composition comprising at least one polyisocyanate or isocyanate prepolymer having a NCO content of about 8% to about 30% by weight based on the prepolymer, at least one catalyst for the reaction of an isocyanate groups with an OH group, at least one blowing agent and at least one foam stabilizer. Not later than one day after the application of the foam from the

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disposable container, the residue left in the disposable container has a diisocyanate monomer content of less than 5% by weight based on the residual content of the empty container. The system of the present invention is particularly useful in that the pressurized container after expulsion of the prepolymer composition can be disposed of without the necessity of using special landfills for hazardous materials. The system of the present invention provides a substantial advantage for general use of the system of the invention.

Claims 15-36 and 40-68 stand rejected under 35 USC 103(a) as being unpatentable over Pauls (US 4,263,412) in view of Schmalstieg et al. (CA 2,084,684; hereafter CA) and Minato et al. (US 5,086,175). Applicants respectfully submit that Pauls, CA and Minato et al. whether considered alone or in combination neither teaches nor suggest the present invention.

Pauls discloses a process for the preparation of a dimensionally stable, one component, polyurethane foam from a storage stable mixture of a prepolymer based on polyols and containing isocyanate groups and organic blowing agents. The aerosol container is a two-compartment pressure pack with the polyurethane prepolymer containing isocyanate groups and a blowing agent included in the inner container and a pressure medium for expelling the prepolymer is contained in the outer container. The reference is completely silent concerning the amount of isocyanate monomer in the composition. However, at column 8, lines 25-35 the specification teaches:

"Advantageously, however, the foamable mixture is prepared directly in the inner container of the two compartment pressure pack. In this preferred procedure, the inner container is filled with starting components for the preparation of the prepolymers containing isocyanate groups and with the additives, but more especially with a mixture of separately prepared prepolymers containing isocyanate groups and additives, the amount introduced being from 50 to 85% by volume, preferably from 60 to 75% by volume based on total volume".

Applicants submit that one skilled in the art would understand that the prepolymer prepared by the standard practice of reacting a large excess of polyisocyanate with a polyol to provide a mixture containing substantial amounts of monomeric polyisocyanates. There is neither teaching nor suggestion that contents of the container after expulsion of the

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prepolymer contains less than 5% by weight of polyisocyanate monomeric materials. There is no recognition that there would be any advantage of providing an empty aerosol container for the polyurethane prepolymer, which contained less than 5% by weight of polyisocyanate monomer. In addition, there is neither teaching nor suggestion on how such a composition could be obtained.

Applicants further submit that there is neither teaching nor suggestion that the prepolymer have an NCO content of from 26 to 30% by weight as presently claimed.

Pauls merely discloses a particular configuration of a known article for dispensing a foamable polyurethane composition. There is neither teaching nor suggestion of any particular low level of monomer content or why such a pressure pack containing a polyurethane prepolymer with a low monomer content would be particularly useful. Applicants respectfully submit that Pauls neither teaches nor suggests the present invention.

The deficiencies in Pauls are not cured by combination with CA and Minato et al. CA and Minato et al. are directed to preparing polyisocyanate prepolymers that are useful for coatings, adhesives, architectural materials, molding materials, etc. CA is directed to particular polyisocyanates based on polyhydroxy polyethers and toluene diisocyanate. The prepolymers are prepared by reacting a polyhydroxy polyether with a large excess of toluene diisocyanate and subsequently distilling the mixture to remove unreacted excess toluene diisocyanate. CA teaches that these polyisocyanates are particularly useful for production of polyurethane lacquers. The prepolymers are particularly useful for preparing lacquers in that they are readily soluble in organic solvents (CA page 4, lines 32-35).

The use of the prepolymer with a low monomer content provides for a longer processing time. The table at page 10 clearly shows the difference in the processing time (time till gelling occurs and the drying time). The composition of the CA invention has a pot life of 5 days and a drying time of 13 hours. The comparative polyisocyanate from example 4 has a pot life of 51 hours and drying time of 5.5 hours. Outside of the extended pot life and the extended drying time, the CA provides no other advantages for utilizing the low monomer content prepolymer.

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The CA composition is not shown to be useful to form a foaming composition that can be expelled from a small portable pressurized container. The prepolymer disclosed in CA is a semi-frigid resin (page 4, line 13). Applicants submit that the rigid nature of the prepolymer of CA would not be useful in the practice of the present invention since solution in an organic solvent could be required. The prepolymers of CA are generally used in a solution of about 50% solvent.

A material which required solution in a solvent would be difficult to use in the present invention since large amounts of solvents are required. The present invention requires only small amounts of pressure and foaming agents to expel the mixture from the container and to foam the prepolymer at the reduced pressure. Applicants respectfully submit that CA does not teach nor suggest a polyurethane prepolymer that would be useful in the practice of the present invention. Applicants therefore respectfully submit that CA does not cure the deficiencies in the Pauls reference. Applicants submit that CA would neither teach nor suggest use of the prepolymer in an aerosol formulation for generation of a foamed resin.

The deficiencies in combination of Pauls with CA are not cured by combination with Minato et al. Minato et al. is directed to an isocyanurate that is substituted with a monoalcohol containing 10 to 50 carbon atoms. The polyisocyanurate composition is prepared by reacting a polyisocyanate in the presence of an isocyanurate catalyst to form an isocyanurate ring, the ring is substituted with a monohydroxyl alcohol containing 10 to 50 carbon atoms either during the isocyanuration or after the isocyanurate has been formed. The specification teaches that the composition is useful for preparation of coatings, adhesives, architectural materials, molding materials and the like. The specification teaches that the diisocyanate is partially reacted to form an isocyanate with or without the presence of the long chain alcohol. Only a small fraction of the diisocyanate is reacted. The polyisocyanate reaction product is then heated under vacuum to remove a large excess of unreacted monomer from the composition. However, there is neither teaching nor suggestion as to the level of monomer that remains in the composition. The isocyanurate is reacted with the monohydroxyl alcohol having from 10 to 50 carbon atoms

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to improve the solvent solubility of the composition. The solvent solubility is critical for forming a useful coating composition, the preferred utility for the composition of the invention. In addition, there is neither teaching nor suggestion that the composition would be useful as a foaming material that is reactable with moisture in the air. Clearly, the coating composition disclosed in Minato et al. is not intended to react with moisture and foam, but to provide a smooth coating to a substrate. In Minato et al. the prepolymers do not react with moisture in the air to form a foam composition, but react with a polyol to form a finished coating.

Applicants respectfully submit that Minato et al. does not disclose the level of the monomer in the composition and therefore merely shows that it is possible to remove some unreacted monomer to provide a composition with a lower level of free monomer. However, Minato et al. teaches that the rate of conversion based on a combined charge of diisocyanate compound and monoalcohol is about 10 to 50% by weight and preferably about 15 to 40% by weight. There is at least 50% of the unreacted starting monomer which must be removed from the composition. The examples show conversion rates in the range of about 18 to 20% that requires a substantial amount of unreacted monomer be removed from the composition. However, the level of removal is not set forth in the reference.

Applicants respectfully submit that Minato et al. in combination with CA and Pauls neither teaches nor suggests the present invention.

Applicants respectfully submit that CA and Minato et al. would neither teach nor suggest to one skilled in the art to utilize the polyisocyanates with the low monomer content in a composition for forming the polyurethane foam of Pauls. Applicants submit that the teaching of Pauls that "virtually all of the prepolymer is expelled" would lead one skilled in the art to the conclusion that it would not be necessary or prudent, in view of the additional cost, to include a polyisocyanate prepolymer containing less than 5% by weight of unreacted monomer in the polyurethane resin formulation since substantially all of the formulation is expelled from the aerosol can due to its particular construction.

Applicants submit that one skilled in the art would not see any need for reducing the

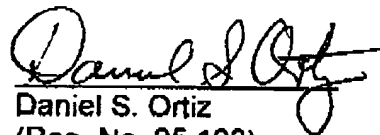
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residual amount of isocyanate monomeric materials in a composition in view of the fact that the composition is virtually completely expelled from the container.

In the previous action, The Examiner stated that the foamed aerosol resin compositions are analogous to the formulations disclosed in the CA and Minato et al. references. However, Applicants respectfully submit that the foamable urethane resins, particularly as applied to aerosol cans, bears no relation to the problems involved in preparing a lacquer composition for application in thin layers to broad surfaces. Applicants therefore respectfully submit that a combination of CA and Minato et al. with Pauls is improper since there must be some suggestion to make the combination.

In view of the above discussion, Applicants respectfully submit that a rejection of the claims under 34 USC 103(a) over Pauls in view of CA and Minato et al. is untenable and respectfully request that the rejection be reconsidered and withdrawn.

Respectfully submitted,



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